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Case Report

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Rarely seen optic disc anomaly: a case of morning glory syndrome

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ABSTRACT

Morning glory syndrome (MGS) is a rare optic nerve anomaly, typically unilateral, characterized by a funnel-shaped macropapilla with neuroglial remnants at its center, surrounded by an elevated and pigmented chorioretinal ring. This condition may be associated with ocular and systemic abnormalities that can impair vision. A 14-year-old female presented to our clinic with a complaint of reduced vision in her right eye. Following a detailed ophthalmological examination and advanced imaging studies, the patient was diagnosed with morning glory disc anomaly (MGDA) in her right eye. This case highlights the importance of advanced imaging technologies in both the diagnosis and follow-up of MGS, as well as their role in the early detection of potential complications.

Keywords: Morning glory syndrome, optic disc, vision loss, ophthalmology

INTRODUCTION

Morning glory syndrome (MGS) is an uncommon anomaly of the optic disc that was first identified by Kindler in the 1970s. It derives its name from its visual similarity to the morning glory flower.[1] It is believed to arise from an anomaly in the development of the optic nerve during the embryonic stage. The syndrome is characterized by the enlargement of the optic disc, a central depression, and the presence of radially oriented blood vessels surrounding it.[2] MGS is typically regarded as a unilateral and congenital anomaly; however, there have been rare instances of bilateral cases documented in the literature.[3]

MGS is often regarded as a distinct anomaly; it may occasionally be linked to neurological disorders, craniofacial anomalies, or, in rare instances, genetic syndromes.[4] Complications related to MGS encompass retinal detachment and vitreoretinal traction, necessitating diligent observation.[5]

In this case report, we present a patient who visited our clinic reporting diminished vision in the right eye, subsequently diagnosed with MGS following a thorough examination. The clinical characteristics and diagnostic approaches related to the syndrome were analyzed in conjunction with existing literature.

CASE

A 14-year-old female presented to our clinic with recently noticed reduced vision in her right eye. The patient's medical history included asthma, with no history of trauma or similar eye conditions in her family. Visual acuity assessment using the Snellen chart showed uncorrected visual acuity of 4/10 and corrected acuity of 8/10 in the right eye, while the left eye was 10/10. Cycloplegic autorefraction revealed -0.50 spherical /-1.00 cylindrical axis 90 in the right eye and -0.25 spherical in the left eye. Anterior segment examination was unremarkable in both eyes. Direct and indirect light reflexes, as well as color vision, were normal. No relative afferent pupillary defect was observed.

Fundus examination revealed a large optic disc in the right eye with deep central excavation, radially arranged vascular structures, and findings characteristic of MGS (Figure 1). The left eye fundus was normal. Fundus autofluorescence (FAF) imaging revealed abnormal hyperfluorescent areas inferior to the right optic disc (Figure 2), with no pathological findings in the left eye. Optical coherence tomography (OCT) showed deep excavation of the right optic disc and surrounding retinal thinning (Figure 3). Humphrey visual field testing indicated an enlarged blind spot in the right eye (Figure 4).

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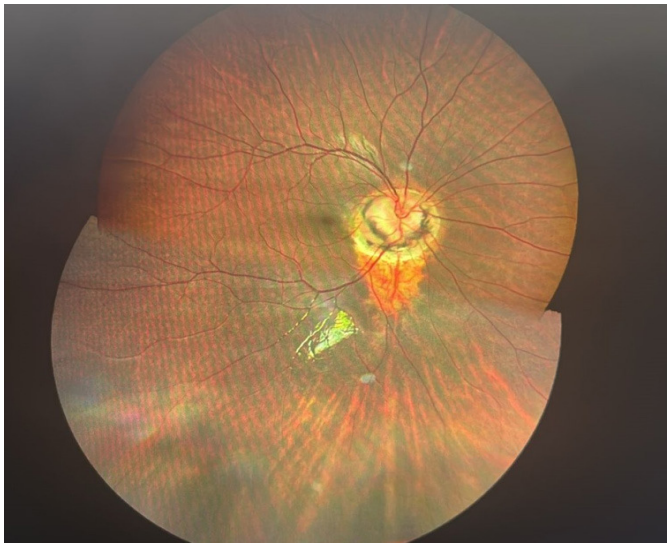

Figure 1. Fundus photograph of right eye

Figure 2. Fundus autofluorescence of right eye

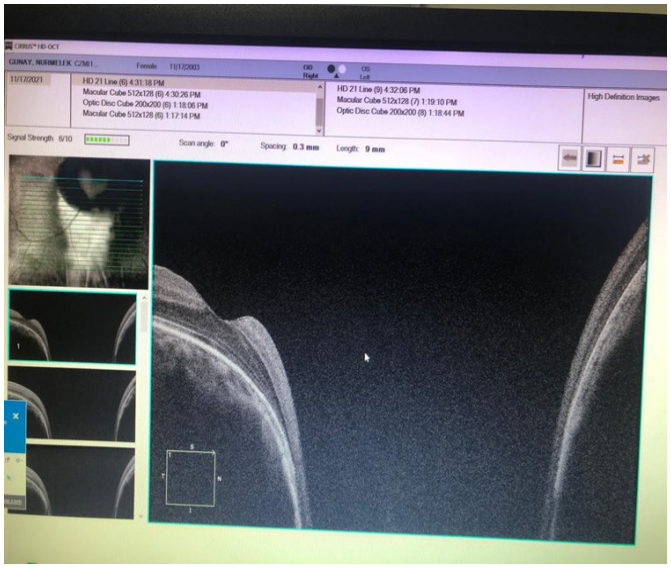

Figure 3. Optical coherence tomography of the patient's right eye

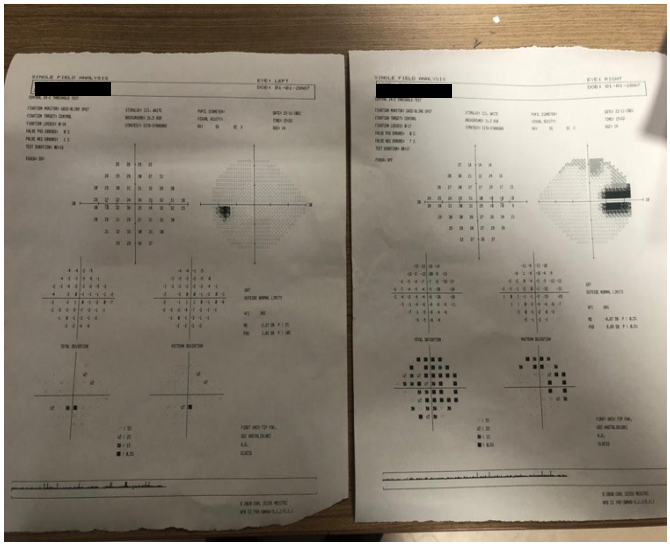

Figure 4. Visual field test photo of the patient

Systemic and neurological examinations revealed no abnormalities. Neurological imaging was not requested due to the absence of clinical findings.

The diagnosis of MGS was confirmed through fundus examination and advanced imaging findings. Given the patient's visual acuity loss in the right eye, the extent of anatomical anomalies was evaluated, and the risk of retinal detachment was carefully assessed. The patient and her family were informed about the irreversible nature of the condition and the importance of regular follow-ups.

In terms of treatment, there is no specific medical or surgical treatment for MGS. However, in this case, three basic approaches have been adopted:

1. Visual rehabilitation: The patient was prescribed glasses to help her adapt better, especially in her educational life.

2. Complication management: The patient was regularly followed up for the risk of retinal detachment. Accordingly, annual fundus examination and, if necessary, advanced imaging techniques were used to monitor retinal integrity.

3. Psychological support and awareness: Psychological counseling was recommended to the patient and his/her family to help them adapt to possible changes in their quality of life due to vision loss. In addition, information about MGS was provided to ensure that the patient and his/her family became aware of this rare condition.

Consent in writing was secured from the patient's family for the utilization results and images for scientific purposes.

DISCUSSION

MGS arises from the inadequate development of the optic disc during the embryonic stage. Recent research indicates that primary mesenchymal irregularities result in aplasia of the lamina cribrosa and insufficient closure of the posterior scleral wall, which play a role in the manifestation of MGS.[6] While often presenting as unilateral vision loss, MGS can

occasionally be associated with craniofacial anomalies or neurological disorders.[7] The optic disc appears enlarged, featuring a funnel-shaped depression at its center. This is associated with peripapillary chorioretinal pigmentary alterations that display orange or pink hues. Additionally, there is an increased presence of blood vessels compared to normal conditions. In contrast to the usual central branching pattern, these vessels demonstrate a radial curvature that resembles the petals of a flower as they radiate outward from the disc.[8]

Complications may arise, including serous retinal detachment, significant refractive errors, amblyopia, and strabismus, with instances of serous detachments documented in as many as 30% of cases.[9] The alterations in mechanical and hemodynamic factors at the periphery of the optic disc may increase the likelihood of choroidal neovascularization, potentially leading to subretinal edema and hemorrhage.[10] MGDA generally occurs infrequently, and no particular genetic mutation has been pinpointed in those affected. Nevertheless, research has revealed mutations in the PAX6 gene among eight patients exhibiting optic nerve anomalies, which includes one instance of bilateral MGDA.[11]

In the diagnosis of MGDA, morphological data provided by advanced imaging methods are as critical as clinical examination for differential diagnosis. OCT shows the funnel-shaped depression around the disc, the presence of subretinal fluid, and irregularities in the peripapillary retinal structure in detail, while fundus fluorescein angiography (FFA) helps detect vascular anomalies, areas of leakage, and possible choroidal neovascularization. Autofluorescence imaging supports the peripapillary morphology specific to MGDA by revealing retinal pigment epithelium (RPE) changes.

The most common differential diagnosis is optic disc coloboma. In coloboma, the depression is usually localized in the lower part of the optic disc, has regular borders, and is often observed bilaterally, whereas in MGDA, the depression is centrally located, and there are prominent peripapillary pigment changes around it and the vascular structure radiating from the disc (flower petal appearance) are the distinguishing features.[12] Therefore, when diagnosing MGDA, disc morphology, lesion location, accompanying retinal changes, and systemic/symptomatic findings should be taken into consideration; if necessary, differential diagnosis should be made with multimodal imaging and genetic tests. Making the differential diagnosis correctly is of vital importance, especially for the effective management of amblyopia and potential retinal complications.

In this case, the patient exhibited no systemic or neurological anomalies, and the syndrome was considered an isolated condition. Fundus imaging demonstrated the characteristic features of MGS, while OCT provided detailed insights into the disc's structural changes.

Accurate diagnosis of MGDA is essential for effective management, including distinguishing it from other congenital optic nerve disorders, such as typical optic nerve coloboma. Early treatment of amblyopia and potential complications is critical for preserving vision and improving outcomes.

CONCLUSION

MGS is a rare optic disc anomaly that requires careful attention in clinical practice. This case not only underscores the importance of early diagnosis and management strategies but also contributes to understanding this rare pathology. The details obtained through modern imaging techniques serve as a guide for both patients and clinicians. Utilizing advanced technologies in the diagnosis and follow-up of this condition is crucial for improving patient outcomes and preventing ophthalmological complications. This case aims to raise awareness of MGS and its potential challenges.

ETHICAL DECLARATIONS

Informed Consent

The parents of the patient signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Kindler P. Morning glory syndrome: unusual congenital optic disk anomaly. *Am J Ophthalmol.* 1970;69(3):376-384. doi:10.1016/0002-9394(70)92269-5
2. Traboulsi EI, O'Neill JF. The spectrum in the morphology of the so-called 'morning glory disc anomaly'. *J Pediatr Ophthalmol Strabismus.* 1988;25(2):93-98. doi:10.3928/0191-3913-19880301-11
3. Dedhia CJ, Gogri PY, Rani PK. Rare bilateral presentation of morning glory disc anomaly. *BMJ Case Rep.* 2016;2016:bcr2016215846. doi:10.1136/bcr-2016-215846
4. Leitch RJ, Winter RM. Midline craniofacial defects and morning glory disc anomaly. A distinct clinical entity. *Acta Ophthalmol Scand Suppl.* 1996;(219):16-19. doi:10.1111/j.1600-0420.1996.tb00375.x
5. Ho CL, Wei LC. Rhegmatogenous retinal detachment in morning glory syndrome pathogenesis and treatment. *Int Ophthalmol.* 2001;24(1):21-24. doi:10.1023/a:1014498717741
6. Lee BJ, Traboulsi EI. Update on the morning glory disc anomaly. *Ophthalmic Genet.* 2008;29(2):47-52. doi:10.1080/13816810801901876
7. Goldhammer Y, Smith JL. Optic nerve anomalies in basal encephalocele. *Arch Ophthalmol.* 1975;93(2):115-118. doi:10.1001/archopht.1975.01010020121004
8. Steinkuller PG. The morning glory disk anomaly: case report and literature review. *J Pediatr Ophthalmol Strabismus.* 1980;17(2):81-87. doi:10.3928/0191-3913-19800301-06
9. Irvine AR, Crawford JB, Sullivan JH. The pathogenesis of retinal detachment with morning glory disc and optic pit. *Retina.* 1986;6(3):146-150. doi:10.1097/00006982-198600630-00002
10. Iovino C, Fossarello M, Peiretti E. Intravitreal aflibercept in the treatment of polypoidal choroidal vasculopathy associated with morning glory syndrome. *Retin Cases Brief Rep.* 2020;14(3):278-281. doi:10.1097/ICB.0000000000000698
11. Azuma N, Yamaguchi Y, Handa H et al. Mutations of the PAX6 gene detected in patients with a variety of optic-nerve malformations. *Am J Hum Genet.* 2003;72(6):1565-1570. doi:10.1086/375555
12. Chang S, Gregory-Roberts E, Chen R. Retinal detachment associated with optic disc colobomas and morning glory syndrome. *Eye (Lond).* 2012;26(4):494-500. doi:10.1038/eye.2011.354